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EXAMINER	
KALIVODA, CHRISTOPHER M	
ART UNIT	PAPER NUMBER
2883	

DATE MAILED: 05/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/620,176	BRYAN ET AL.	
	Examiner	Art Unit	
	Christopher M. Kalivoda	2883	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-52* is/are pending in the application.

4a) Of the above claim(s) *1-16 and 29-52* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *17-28* is/are rejected.

7)☒ Claim(s) *23* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *15 July 2003* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *7/15/03*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Restriction to one of the following inventions is required under 35 U.S.C. 121:

I. Claims 1-39, drawn to a method of making by altering the refractive index of a photosensitive material by irradiating with light, classified in class 438, subclass 31.

II. Claims 40-49, drawn to an optical structure comprising a photosensitive optical material with a light-induced change in refractive index, classified in class 385, subclass 123.

III. Claims 50-52, drawn to making a material by implanting impurities to form a fracture band with a transfer layer above the fracture band and fracturing or cleaving classified in class 65, subclass 433.

The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case, the process as claimed can be used to make the device in U.S. Patent 4,514,053 to Borelli et al.

Inventions I and III and II and III are unrelated. Inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different modes of operation, different functions, or different effects (MPEP § 806.04, MPEP §

808.01). In the instant case inventions are different because Group I and III have different functions. Group 1 is a method of making in which light is used to alter the refractive index and Group III is a method of fracturing or cleaving a component. Similarly, Group II and Group III also have different functions in which Group II is an apparatus comprising a light-induced change in refractive index and Group III is a method of fracturing or cleaving a component.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

Should Applicant elect Invention I, this application contains claims directed to the following patentably distinct species of the claimed invention:

Group 1, claims 1-16, directed to a method of altering the refractive index on an optical material by irradiation with light which is not patterned and not claimed in Groups 2 or 3.

Group 2, claims 17-28, directed to a method of producing a gradient refractive index in an optical material not claimed in Group 1 or Group 3

Group 3, claims 29-39, directed to a method for altering the refractive index of a material in which the material comprises a composition variation resulting in a pattern of photosensitive material not claimed in Groups 1 or 2.

Applicant is required under 35 U.S.C. 121 to elect a single disclosed species for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. Currently, no claims are generic.

Applicant is advised that a reply to this requirement must include an identification of the species that is elected consonant with this requirement, and a listing of all claims readable thereon, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which are written in dependent form or otherwise include all the limitations of an allowed generic claim as provided by 37 CFR 1.141. If claims are added after the election, applicant must indicate which are readable upon the elected species. MPEP § 809.02(a).

Should applicant traverse on the ground that the species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

During a telephone conversation with Mr. Peter Dardi on April 21, 2005 a provisional election was made with traverse to prosecute the invention of Group 2, claims 17-28. Affirmation of this election must be made by applicant in replying to this Office action. Claims 1-16 and 29-52 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Specification

The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Drawings

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "178" has been used to designate both a funnel section and delivery section. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and

informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

Claim 23 is objected to because of the following informalities: The claim references "the irradiation direction". However, there is no prior reference to any direction. For example, the irradiation could have been a wide area irradiation Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 17 and 18 are rejected under 35 U.S.C. 102(e) as being anticipated by Payne et al., U.S. Patent 6,160,944. Regarding independent claim 1, Payne et al. teach a method for producing a gradient in index of refraction in an optical material comprising a photosensitive optical material (col 8, lines 12-15 and Fig 5, ref sign 210), the method comprising irradiating (col 3, lines 6-12, especially line 12) the photosensitive optical material to create a light-induced gradient in index of refraction (col 3, lines 6-12, especially lines 8-9 "linear refractive index variation").

Regarding claim 18, the optical material comprises a planar optical structure (Fig 5, ref sign 230).

The limitations of Payne et al., clearly fully meet applicant's claimed limitations.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 19-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Payne et al., U.S. Patent 6,160,944.

Regarding claim 19, Payne et al. teach the limitations of claim 18 as described above. Furthermore, the gradient in index of refraction is oriented along the plane of the structure since it is generated along a length of waveguide (col 3, lines 6-12, especially line 9).

Regarding claim 20, Payne et al. teach the limitations of claim 18 as described above. While the reference does not specifically state "oriented perpendicular to the plane of the structure", there would be a gradient oriented perpendicular to the structure as well since radiation is absorbed as it passes though the photosensitive material and more absorption occurs as the radiation passes through more material (i.e. the deeper into the material).

Regarding claim 21, Payne et al. teach the limitations of claim 17 as described above. Furthermore, the optical material can also comprise a preform (col 4, lines 58-61 and Fig 1, ref sign 100). In addition, the aspect ratio (a=L/D) is clearly at least about 5 since the diameter is about 5 microns (col 6, line 50) and the length is measured in kilometers (col 6, line 51).

Regarding claim 22, Payne et al. teach the limitations of claim 17 as described above. Furthermore, the photosensitive optical material comprises at least about 1 mole percent germanium as a fraction of the total metal/metalloid content of the photosensitive optical material (col 5, line 22).

Regarding claim 23, Payne et al. teach the limitations of claim 17 as described above. Furthermore, the irradiating is performed for a selected time of period with light having an intensity (col 8, line 23 since saturation is controlled) and wavelength (col 4, lines 36-39 since UV light is selected) to induce the gradient index of refraction along the irradiation direction.

Regarding claim 24, Payne et al. teach the limitations of claim 23 as described above. Furthermore, the light intensity and composition of the photosensitive material produce absorption of light in the linear Beer's law regime of spatial variation since saturation may not occur (col 8, lines 23-27).

Regarding claim 25, Payne et al. teach the limitations of claim 23 as described above. Furthermore, the light intensity and composition of the photosensitive material produce absorption of light with non-linear spatial variation since saturation can occur (col 8, lines 23-27).

Regarding claim 26, Payne et al. teach the limitations of claim 17 as described above. Furthermore, the photosensitive optical material comprises a gradient composition of a dopant that induces photosensitivity of the material wherein the composition gradient results in the index-of-refraction gradient following illumination (col 3, lines 8-9 "linear refractive index variation") since there is a linear gradient refractive index and the photosensitive material changes refractive index upon illumination (col 3, lines 11-12).

Regarding claim 27, Payne et al. teach the limitations of claim 17 as described above.

However, the reference is silent with respect to the gradient extending across a distance of at least 10 microns.

Payne et al. does teach that a gradient can be used in a beam-size adjusting device to change the size of a guided beam (col 3, lines 6-12).

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to modify the invention of Payne et al. to have the gradient extending across a distance of at least 10 microns in order to reduce the beam diameter to small diameters and increase intensity.

Regarding claim 28, Payne et al. teach the limitations of claim 17 as described above. Furthermore, the gradient in index or refraction is at least about 1×10^{-8} index units per micron since index changes of 1×10^{-3} (col 7, lines 43-44) over 15 mm (col 7, lines 14-15) are contemplated and $1 \times 10^{-3} / 15 \times 10^{3}$ microns is about 6.7×10^{-8} index units per micron.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patent 4,514,043 to Borrelli et al., U.S. Patent 6,542,690 to Ellison et al. and U.S. Patent 4,907,864 to Hagerty et al. each describe using UV light to produce a light-induced gradient index of refraction as in claim 1. U.S. Patent 4,877,717 to Suzuki et al. describes using UV to change refractive index of materials.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher M. Kalivoda whose telephone number is (571) 272-2476. The examiner can normally be reached on Monday - Friday (8:30 - 5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank G. Font can be reached on (571) 272-2415. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Cmk
04/22/05

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